

PEST MANAGEMENT (ACRE)

CODE 595

MONTANA TECHNICAL GUIDE

SECTION IV

DEFINITION

Managing weeds, insects, diseases, animals, and other pests—including invasive and non-invasive species—utilizing prevention, avoidance, monitoring, and suppression strategies.

PURPOSES

This practice is applied as part of a resource management system to support one or more of the following purposes:

- Enhance quantity and quality of commodities and desired ecosystem condition;
- Minimize negative impacts of pest control on soil resources, water resources, air resources, plant resources, and/or animal resources.

CONDITIONS WHERE PRACTICE APPLIES

Wherever pest management is needed in terrestrial and aquatic ecosystems and **where** pest control activities have the potential to **negatively** affect non-target species **and natural resources**.

CRITERIA

General Criteria Applicable to All Purposes

A pest management component of a conservation plan will be developed.

All methods of pest management must comply with Federal, State, and local regulations—including management plans for invasive pest species and noxious weeds. **The State of**

Montana Department of Agriculture, through the Montana Pesticide Act, administers rules and regulations concerning pesticides and their use in Montana.

Integrated pest management (IPM) programs **and principles** shall be utilized to balance economics, efficacy, and environmental risk.

(IPM is an approach to pest control that combines biological, cultural, and other alternatives to chemical controls with the judicious use of pesticides. The objective of IPM is to maintain pest levels below economically damaging levels while minimizing harmful effects of pest control on human health and environmental resources.)

An appropriate set of mitigation techniques must be **designed and** implemented to address the environmental risks of pest management activities in order to adequately treat identified resource concerns. Mitigation techniques include practices such as filter strips, crop rotation, and management techniques like application method and timing.

All methods of pest management must be integrated with other components of the conservation plan, **i.e., compliance plans**.

This practice has the potential to affect National Registered listed or eligible (significant) cultural resources. Follow **Natural Resources Conservation Service** state policy for considering cultural resources during planning, application, and maintenance. See **USDA–Natural Resources Conservation Service, Field Office Technical Guide (FOTG), Section I, Cultural Resources Information; Montana Cultural Resources Handbook, 420-VI, Part 601; and General Manual, Part 420-SSC, MT401.**

NOTE: This type of font (**AaBbCcDdEe 123..**) indicates NRCS National Standards.
This type of font (**AaBbCcDdEe 123..**) indicates Montana Supplement.

When developing pest management alternatives that include chemical controls, the following shall apply:

- Both pesticide label instructions and **Montana Extension Service** recommendations shall be followed. **All recommendations must follow the current Montana–Utah–Wyoming Weed Management Handbook.** Pay special attention to environmental hazards and site-specific application criteria.
- Compliance with Federal, State and local laws is required, e.g., Food Quality Protection Act (FQPA), Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), Worker Protection Standard (WPS) and Interim Endangered Species Protection Program (H7506C). **Montana Threatened and Endangered Species considerations must follow the USDA–Natural Resources Conservation Service, FOTG, Section I, Threatened and Endangered Species List.**
- **Montana NRCS employees must hold a current Montana Pesticide Certification– Agricultural Plant/Pest classification in order to implement or review pest management components and systems.**

Additional Criteria to Protect Quantity and Quality of Agricultural Commodities and Desired Ecosystem Condition

IPM will be used where available; however, if IPM programs are not available, the level of pest control must be the minimum necessary to meet the client's objectives for commodity quantity and quality and/or desired ecosystem condition. See **TABLE 1–Montana IPM Programs.**

Additional Criteria to Protect Soil Resources

In conjunction with other conservation practices, the number, sequence, and timing of tillage operations shall be managed to maintain soil quality and maintain soil loss below or equal to the soil loss tolerance (T) or any other planned soil loss objective. **Approved erosion prediction tools are WEQ Management Period Method and the Revised Universal Soil Loss Equation, RUSLE.** Where soil quality is a concern the Soil Conditioning Index (SCI) shall be used to assess soil health.

Additional Criteria to Protect Water Resources

Pesticide environmental risks, including the impacts of pesticides in ground and surface water on non-target plants, animals and humans, must be evaluated for all identified water resource concerns. **Planners must identify fields or areas of fields that are susceptible to surface or ground water contamination. An evaluation will be made for each field or conservation treatment unit (CFU). Pesticide environmental risk evaluation must include Windows Pesticide Screening Procedure (WIN_PST). Evaluation procedures other than WIN_PST must be prior approved by the state agronomist.**

Areas with potential leaching hazards are identified on county “Areas Sensitive to Leaching” maps, located in Field Office Technical Guide, Section I, Maps. Site specific planning may be accomplished by reviewing the “Map Units Sensitive to Leaching” tables, FOTG, Section II, Water Quality and Quantity Interpretations.

The Farm-A-Syst evaluation procedure may be used to evaluate pesticide contamination potentials for farmstead and feedlot areas.

When a chosen alternative has significant potential to negatively impact important water resources, (i.e. WIN_PST "Extra High," "High," or "Intermediate" soil/pesticide human risk ratings in the drainage area of a drinking reservoir), an appropriate set of mitigating practices **MUST** be put in place to address risks to humans and non-target aquatic and terrestrial plants and wildlife.

Mitigation practices for minimizing groundwater contamination by leaching of a pesticide or associated metabolites are those practices that reduce or eliminate exposure or infiltration. Examples of these practices include reduced rates, foliar applications, alternative pesticides, and alternative controls.

Mitigation practices for limiting surface water contamination by runoff of a pesticide or associated metabolite (including runoff of soil adsorbed pesticides) are those practices that minimize water runoff and soil erosion. Examples of these practices are residue management, crop rotation, irrigation water management, and filter or buffer strips.

Open mixing of chemicals shall not occur in the application field within a minimum of 100 feet from a well or surface water body. Open mixing should be performed down gradient of wells.

The number, sequence and timing of tillage operations shall be managed in conjunction with other sediment control tactics and practices, in order to minimize sediment losses to nearby surface water bodies.

Additional Criteria to Protect Air Resources

Follow pesticide label instruction for minimizing volatilization and drift that may impact non-target plants, animals and humans.

Additional Criteria to Protect Plant Resources

Prevent misdirected pest management control measures that negatively impact plants (e.g., removing pesticide residues from sprayers before moving to the next crop and properly adjusting cultivator teeth and flame burners).

Follow pesticide label directions specific to the appropriate climatic conditions, crop stage, soil moisture, pH, and organic matter in order to protect plant health.

Follow label restrictions for pesticides that can carry over in the soil and harm subsequent crops.

Additional Criteria to Protect Animal Resources

Follow pesticide label instruction for minimizing negative impacts to both target and non-target animals.

CONSIDERATIONS

When IPM programs are not available, basic IPM principles should be strongly encouraged. **Field scouting, pest identification, evaluating economic thresholds, and choosing appropriate control methods are basic to IPM.** Control measures may include using mechanical, biological, cultural, and chemical control methods. An effective pest management program will usually include more than one control method. Consideration of the impacts of mechanical, biological, and cultural controls should be considered before relying on chemical controls. Avoid routine preventative pest

control measures. Utilize spot treatments whenever practical.

Cultural Control

Cultural methods of pest control breaks the infestation cycle by making the environment less suitable for pest survival. This is accomplished by:

- Reducing favorable habitat of pests;
- Altering planting patterns to disrupt in time and space the food and other habitat resources required by the pest;
- Diverting mobile pests away from the crop;
- Enhancing the vigor of the crop that it can better tolerate pest injury.

Examples of cultural controls used in IPM include:

- Crop rotation
- Tillage operations that destroy the “green bridge,” aerate the soil, or bury residues
- Altering planting dates
- Altering seeding rates, crop spacing
- Sanitation practices (cleaning equipment)
- Cover crops
- Trap strips

Biological Control

Biological controls use living organisms (natural enemies) to suppress populations of other pests. These include:

- **Predators**—free living animals (insects, arthropods, birds, reptiles and mammals) that eat pests.
- **Parasitoids**—are insect parasites of other insects. Most parasitoids are small wasps or flies.
- **Pathogens**—disease causing microorganisms. including viruses, bacteria, fungi, and nematodes.

Mechanical Control

These include temperature manipulations, screens placed in irrigation ditches to reduce weed seed movement, insect traps, and frightening devices to repel birds and mammal pests. Mechanical control also includes tillage, roughing, and manual pulling of weeds.

Host Resistance

Planting varieties tolerant of or resistant to pest attack is an economical and safe method of pest control.

Practices such as rotating control methods enhance overall pest control since it disables pests from becoming resistant. Combine different control tactics into an overall strategy that balances the strengths of each against the individual weaknesses.

Select pesticides for a specific pest with an alternate mode-of-action to minimize the development of pesticide resistance.

Most crops/forages can tolerate some level of pest infestation without loss in harvestable quantity or quality (economic threshold). Reduce pest populations below levels that are economically damaging rather than totally eliminating infestations.

Adequate plant nutrients and soil moisture, including favorable pH and soil conditions, should be provided to reduce plant stress, improve plant vigor and increase the plant's overall ability to tolerate pests.

On irrigated land, irrigation water management should be designed to minimize pest management environmental risk.

Table 2—Critical Scouting Periods for Weed Management, may be used as a guideline for scheduling on-site weed infestation investigations.

Producers should be aware of neighboring fields where organic production is practiced in an effort to minimize any potential adverse impacts on those crops and associated certification.

PLANS AND SPECIFICATIONS

The pest management component of a conservation plan shall be prepared in accordance with the criteria of this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

As a minimum, the pest management component of a conservation plan will include:

- Plan map and soil map of managed fields, if applicable.

- Location of sensitive resources and setbacks, if applicable.
- Crop sequence and rotation, if applicable.
- Identification of target pests, and when available, IPM scheme for monitoring pest pressure.
- Recommended and producer selected methods of pest management (biological, cultural or chemical), including rates, product and form, timing, and method of applying pest management as stated in the **Montana Weed Management Handbook**. This information must be available at the level of detail required by the environmental risk assessment. It can be taken directly from **Montana** Extension recommendations or categorized from those recommendations to fit the input requirements.
- Results of pest management environmental assessments (i.e., WIN_PST, RUSLE, WEQ) and a narrative describing potential impacts on non-target plants and animals, through soil, water and air resources as appropriate.
- Record of producer's decisions as **documented on the Montana pest management job specification**.
- Operation and maintenance instructions.

OPERATION AND MAINTENANCE

The pest management component of a conservation plan shall include the following operation and maintenance items:

- A safety plan complete with telephone numbers and addresses for emergency treatment centers for individuals exposed to chemicals and the telephone number for the nearest poison control center. The National Pesticide Telecommunications Network (NPTN) telephone number in Corvallis, Oregon, may also be given for non-emergency information:

1-800-424-7378

Monday - Friday

6:30 am to 4:30 pm Pacific Time

In Montana, the poison control number is:

1-800-525-5042

For advice and assistance with emergency spills that involve agrichemicals in Montana, phone calls in the following order should be made:

- 1st responder – 911**
- 2nd responder – local sheriff or police**
- 3rd responder – County D.E.S. (Disaster Emergency Services)**
- 4th responder – Montana Department of Agriculture–444-3730**

The national CHEMTRAC (Chemical Transportation Emergency Center) telephone number is:

1-800-424-9300

- Posting of signs according to label directions and/or Federal, State, and local laws around fields that have been treated. Follow restricted entry intervals.
- Disposal of pesticides and pesticide containers must be in accordance with label directions and adhere to Federal, State, and local regulations.
- The requirement that pesticide users must read and follow label directions, maintain appropriate Material Safety Data Sheets (MSDS), and become certified to apply restricted use pesticides.
Material safety data sheets and pesticide labels may be accessed on the Internet at www.greenbook.net/free.asp.
- Calibration of application equipment according to **Montana** Extension Service recommendations before each seasonal use and with each major chemical change.

- The requirement that worn nozzle tips, cracked hoses, and faulty gauges must be replaced.
- The requirement that the client shall maintain records of pest management for at least two years. Pesticide application records shall be in accordance with USDA Agricultural Marketing Service's Pesticide Record Keeping Program and state specific requirements.

REFERENCES

USDA–Natural Resources Conservation Service, National Agronomy Manual (NAM).

State of Montana, Department of Agriculture, Montana Pesticide Act, 1998.

Council on Environmental Quality, Integrated Pest Management, December 1979.

State of Montana, Department of Agriculture, Montana Generic Management Plan; Managing Pesticides to Protect Ground Water, 1998.

Pesticide Record Keeping Program, Agricultural Marketing Service, USDA, 1997.

Extension Services of Montana State University, Utah State University, and the University of Wyoming, 1997-1998 Montana-Utah-Wyoming Weed Management Handbook.

USDA–NRCS, Montana Cultural Resource Handbook, 420-VI, Part 601, 1998.

Conservation practice standards are reviewed periodically and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

TABLE 1. Montana IPM Programs. *

CROP (PEST SPECIES)	ECONOMIC THRESHOLD/SAMPLE TECHNIQUE
ALFALFA HAY	
Alfalfa caterpillar	10 per 90° sweep
Alfalfa weevil	10 per 90° sweep
Pea aphid	300 per 90° sweep
Spotted alfalfa aphid	Dryland = 5–10 per 90° sweep. Irrigated = undefined
Cutworms	5 per square foot of soil around plant
Blister beetles	NONE ESTABLISHED
Grasshoppers	10 per square yard
Meadow spittlebug	NONE ESTABLISHED
Spider mites	NONE ESTABLISHED
ALFALFA SEED	
Seed Chalcid	none established
Alfalfa weevil	20 per 90° sweep
Aphids	100–300 per 90° sweep
Armyworms and cutworms	same as hay
CORN	
Aphids	100 per plant tassel emergence
Corn earworm	greater than 150 moths per pheromone trap
Corn rootworms	5 or more per plant as silking begins
Cutworms and armyworms	1–4 worms per linear foot of row
Grasshoppers	8 per square yard in field or 20 per square yard in margins
Seed corn maggot	NONE ESTABLISHED
Wireworms	NONE ESTABLISHED
Spider mites	NONE ESTABLISHED
SMALL GRAINS	
Aphids (other than Russian wheat)	2–10 per tiller, per stem, or per head, prior to dough stage
Russian wheat aphid	
Armyworms and cutworms	4–5 per square foot
Thrips	20–50 per plant before heads form
Wheat stem maggot	NONE ESTABLISHED
Wheat stem sawfly	NONE ESTABLISHED
Wireworms	20% stand reduction
SUGARBEETS	
Beet leafhopper	5 per 10 180° sweeps
Cutworms	4–5% cutting of seedling beets
Flea beetles	NONE ESTABLISHED
Sugarbeet root maggot	NONE ESTABLISHED
Sugarbeet webworm	when 50% of leaves show eggs or small larvae

* From State of Montana, Department of Agriculture

NO INFORMATION

TABLE 2. Critical Scouting Periods for Weed Management. * **

	Jan - Mar	April	May	June	July	August	Sept	Oct	Nov
Corn Soybeans		Vegetation Survey 1-2 WBP (esp no-till)		Weed Survey 3-5 WAP Herbicide Evaluation		Final Weed Survey (prior to frost)			
Fall Seeded Small Grain		Weed Survey		Preharvest Weed Survey			Vegetation Survey 1-2 WBP (esp no-till)		Weed Survey 3-6 WAP
Spring Seeded Small Grains		Vegetation Survey 1-2 WBP (esp. no-till)	Weed Survey 3-6 WAP		Preharvest Weed Survey				
Fall Seeded Forage		Weed Survey			Vegetation Survey 1-2 WBP (esp no-till)		Weed Survey 3-6 WAP		
Spring Seeded Forage		Vegetation Survey 1-2 WBP (esp. no-till)	Weed Survey 3-6 WAP				Weed Survey		
Established Forage	Weed Survey		Between Cuttings	Between Cuttings	Between Cuttings		Weed Survey		

NO INFORMATION